IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Yoriaki MATSUZAKI et al.

Serial NO. : 09/806,340 Examiner: C. Shosho

Field March 29, 2001 Art Unit: 1714

For : YELLOW HUE COMPOUND AND AQUEOUS INK FOR INK-JET RECORDING SYSTEM USING THE SAME

DECLARATION

Honorable Commissioner of Patent and Trademarks
Washington, DC 20231

Sir:

Ryu OI declares and states that:

1. He is one of the joint applicants in the above application.

2. He has graduated from Okayama University, Okayama, Japan, with a master degree in department of industrial chemistry in March 1984. Since April 1984 he has been employed by Mitsui Chemicals Inc., the assignee of the above application. Since January 1991, he has been engaged in research and development of functional coloring matter and ink for ink-jet recording at the Central Research Institute in the Company.

3. He has studied the Office Action of July 14, 2003.

4. The following experiments have been conducted by him or under his direct supervision:

EXPERIMENTS

Examples 1-3 and Comparative Examples 1-3

To an autoclave equipped with a thermometer and a stirrer, 180 parts of dimethyl terephthalate, 10 parts of pentasodium sulfoisophthalic acid dimethyl

ester, 130 parts of ethylene glycol, 25 parts of tricyclodecanedimethanol and 0.1 part of tetrabutoxytitanate was charged, and the mixture was heated at 180 to 220 ℃ for approximately 3 hours for transesterification. Subsequently, the reaction mixture was heated to 240℃, the pressure in the autoclave was then lowered slowly to 10 mmHg, and the reaction was continued for 1 hour. The pressure in the autoclave was returned to atmospheric pressure to obtain a copolyester resin.

Then, 100 parts of the resulting polyester resin, 150 parts of methyl ethyl ketone, 150 parts of tetrahydrofuran and 10 parts of the coloring matter for ink-jet recording indicated respectively at "a" to "f" in Table 1 were mixed.

Thereafter, 600 parts of deionized water was added thereto, and these were further mixed. This mixture was filtered through a 0.8-micron membrane filter, and heated to distill off the solvent. After cooling, deionized water was added to adjust the solid content to 20% by weight. Thus, a dispersion of colored resin fine particles was obtained. The resin fine particles dispersed in the dispersion were fine particles of the resin colored in yellow tint, having an average particle diameter of 0.2 μm.

Glycerin and deionized water were added to the dispersion of the colored resin fine particles to obtain aqueous ink having a solid content of 15% by weight.

This aqueous ink was charged into an ink cartridge for a piezo-type ink jet printer, and printing and image recording were conducted with this printer.

Evaluation of a light resistance:

A printing density (OD value) before irradiation or after 100 hours of irradiation was measured using a xenon fadeometer (manufactured by Suga Shikenki), and the light resistance was evaluated upon comparing OD_2.

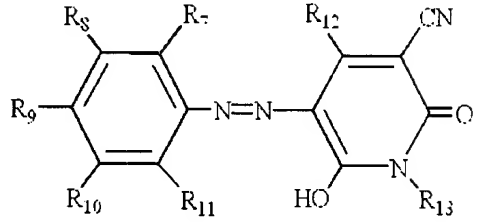
OD_2 = (OD value after irradiation) / (OD value before irradiation) × 100

CONCLUSION

Consequently, the coloring matters defined in the present invention have outstanding excellent light resistance as shown in Table 1.

Table 1

	STRUCTURAL FORMULA							OD_2
	R_7	R_8	R_9	R_{10}	R_{11}	R_{12}	R_{13}	
a	H	$CON[CH_2CH(C_2H_5)C_4H_9(n)$	H	H	H	$C_4H_9(n)$	$C_8H_{17}(n)$	95
b	$CON[CH_2CH(C_2H_5)C_4H_9(n)$	H	H	H	H	$C_4H_9(n)$	$C_8H_{17}(n)$	97
c	H	H	$CON[CH_2CH(C_2H_5)C_4H_9(n)$	H	H	$C_4H_9(n)$	$C_8H_{17}(n)$	96
d	H	$CON[CH_2CH(C_2H_5)C_4H_9(n)$	H	H	H	$C_3H_7(n)$	$C_8H_{17}(n)$	81
e	$CON[CH_2CH(C_2H_5)C_4H_9(n)$	H	H	H	H	$C_3H_7(n)$	$C_8H_{17}(n)$	83
f	H	H	$CON[CH_2CH(C_2H_5)C_4H_9(n)$	H	H	$C_3H_7(n)_3$	$C_8H_{17}(n)$	82



(2)

The undersigned declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application of document or any registration resulting there from.

Date: November 13, 2023

Ryu OI